UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,052	10/06/2000	Brian Wesley Damon	LE9-99-149	3140

21972 7590 06/03/2004

LEXMARK INTERNATIONAL, INC.
INTELLECTUAL PROPERTY LAW DEPARTMENT
740 WEST NEW CIRCLE ROAD
BLDG. 082-1
LEXINGTON, KY 40550-0999

EXAMINER	
THOMPSON, JAMES A	
ART UNIT	**PAPER NUMBER**
2624	3

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/685,052	DAMON ET AL.	
	Examiner	Art Unit	
	James A Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 9-10 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida (US Patent 5,719,680).

Regarding claim 1: Yoshida discloses a method for reducing the occurrence of print artifacts in an imaging machine comprising the steps of applying electronic printhead skew correction to image data (column 2, lines 15-17 of Yoshida) corresponding to at least one of a plurality of image planes (column 2, lines 29-32 of Yoshida) to generate skew corrected image data (column 2, lines 19-22 of Yoshida); and modifying an associated halftone screen to eliminate distortion introduced into said associated halftone screen by said electronic printhead skew correction (column 3, lines 19-28 of Yoshida). The magenta head is modified (column 3, lines 19-25 of Yoshida) such that said magenta head is in the correct alignment with the yellow head (column 3, lines 25-28 of Yoshida), thus eliminating any associated distortion. Modification of the print dot locations of the magenta printing head (column 3, lines 19-28 of Yoshida) inherently requires the modification of an associated halftone screen since an associated halftone screen is used to determine the print dot locations.

Regarding claim 4: Yoshida discloses a method for reducing the occurrence of print artifacts in an imaging machine, comprising the steps of determining which of a plurality of printhead units require printhead skew correction (column 2, lines 15-17 of Yoshida); receiving continuous tone data to be printed (column 2, lines 17-19 of Yoshida); generating from said continuous tone data a plurality of image bytemaps (column 2, lines 12-14 and lines 17-18 of Yoshida), each of said plurality of image bytemaps corresponding to a respective one of a plurality of image planes (column 2, line 64 to column 3, line 5 of Yoshida) and to a respective one of said plurality of printheads (column 2, lines 29-32 of Yoshida); and applying electronic printhead skew correction (figure 4 and column 2, lines 19-22 of Yoshida) to each image bytemap associated with a printhead unit requiring printhead skew correction (column 2, lines 58-63 of Yoshida) to generate a corresponding skew corrected image bytemap (column 2, lines 19-22 of Yoshida). Since image data is supplied for printing (column 2, lines 17-19 of Yoshida) and there are a plurality of print heads (column 2, lines 59-61 of Yoshida), then there are inherently a plurality of image bytemaps, since each bytemap is the data that each corresponding print head needs to print.

Yoshida further discloses, after the step of applying electronic printhead skew correction, applying an associated halftone screen to each of said corresponding skew corrected image bytemap and to each of said plurality of image bytemaps not receiving application of electronic printhead skew correction to form corresponding halftoned image data (column 3, lines 16-18 of Yoshida). Since the dot data for the print heads is supplied to the LED heads (column 3, lines 16-18 of Yoshida), it is inherent that an

associated halftone screen is applied to each of the bytemaps since said associated halftone screens are required for determining print dot locations for each printed color. In order to print the image, said associated halftone screens inherently have to be applied to each color that is to be printed, which would therefore include both the skew corrected image bytemaps and the image bytemaps not receiving application of electronic printhead skew correction.

Yoshida further discloses serializing each of said corresponding halftoned image data to a respective one of said plurality of printhead units (column 3, lines 14-18 of Yoshida). The data supplied to the print heads must inherently be halftone data in order for the print heads to print the image (column 3, lines 16-22 of Yoshida).

Regarding claim 9: Yoshida discloses a method for reducing the occurrence of print artifacts in an imaging machine, comprising the steps of determining which of a plurality of printhead units require printhead skew correction (column 2, lines 15-17 of Yoshida); receiving continuous tone data to be printed (column 2, lines 17-19 of Yoshida); and generating from said continuous tone data a plurality of image bytemaps (column 2, lines 12-14 and lines 17-19 of Yoshida), each of said plurality of image bytemaps corresponding to a respective one of a plurality of image planes (column 2, line 64 to column 3, line 5 of Yoshida) and to a respective one of said plurality of printheads (column 2, lines 29-32 of Yoshida); and establishing at least one halftone screen (figure 5 and column 2, lines 18-22 of Yoshida). Supplying data to a print head (figure 5 and column 2, lines 21-22 of Yoshida) inherently requires a halftone screen in order to obtain the print dot locations.

Yoshida further discloses, for each of said plurality of image planes associated with a printhead requiring printhead skew correction, shifting a starting point of application of said at least one halftone screen to the corresponding image bytemap in a direction opposite to and of a magnitude equal to a shift direction and shift magnitude of an electronic printhead skew correction which is to be applied (column 3, lines 19-28 of Yoshida). To correct the skew of the magenta head, the print head position is shifted to compensate (column 3, lines 19-25 of Yoshida) and is thus correctly superimposed on the yellow image (column 3, lines 25-28 of Yoshida). Printing the dots for the magenta head (column 3, lines 20-25 of Yoshida) inherently requires a halftone screen in order to determine the location of the printed dots. Since the skew is corrected (column 3, line 19 of Yoshida) and the magenta head is thus properly aligned with the yellow image (column 3, lines 27-28 of Yoshida), then the starting point of said halftone screen must inherently be shifted in a direction opposite to and of a magnitude equal to a shift direction and shift magnitude of an electronic printhead skew correction in order to properly compensate for the amount of skew.

Yoshida further discloses applying said at least one halftone screen to said corresponding image bytemap (column 2, lines 17-22 of Yoshida). The image data for each print head (column 2, lines 17-19 of Yoshida) constitutes an image bytemap. A halftone screen is inherently required in order for each print head to print based on said image data.

Yoshida further discloses applying said electronic printhead skew correction to the halftone image bytemap of the first applying step (column 2, lines 15-17 of Yoshida);

and serializing the halftoned image bytemap of the second applying step to the respective one of said plurality of printhead units (column 3, lines 14-18 of Yoshida).

Regarding claim 10: Yoshida discloses that the halftone dots for each printhead that requires skew correction are shifted by the amount of the skew (column 3, lines 19-25 of Yoshida) such that said halftone dots are printed at the originally intended positions (column 3, lines 25-28 of Yoshida). This is the same as determining a skew correction factor based on the formula $CF(SK, S) = \frac{SW(S-1)}{SL/_{SK+1}} + X$ wherein CF is the skew correction factor, rounded down to the nearest integer, SK is the skew magnitude, SW is a width of each said plurality of blocks, S is a number of the block under consideration, SL is a scan length of a full row of an image bit map, and X is a skew and bow offset. Correcting the skew as taught by Yoshida and calculating a skew correction factor both alter the positions at which the halftone dots are printed such that said halftone dots are printed at the intended positions (column 3, lines 25-28 of Yoshida). Both comprise the same physical embodiment. Both of said physical embodiments are simply expressed differently.

Regarding claim 14: Yoshida discloses a method for reducing the occurrence of print artifacts in an imaging machine comprising the steps of applying electronic printhead skew correction to image data (column 2, lines 15-17 of Yoshida) corresponding to at least one of a plurality of image planes (column 2, lines 29-32 of Yoshida) to generate skew corrected image data (column 2, lines 19-22 of Yoshida); and modifying an associated halftone screen to eliminate halftone noise introduced into

said electronic printhead skew correction (column 3, lines 19-28 of Yoshida). The magenta head is modified (column 3, lines 19-25 of Yoshida) such that said magenta head is in the correct alignment with the yellow head (column 3, lines 25-28 of Yoshida), thus eliminating any associated distortion. An associated halftone screen is inherently required in order for the print heads to print dots.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2-3, 5-8 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida (US Patent 5,719,680) in view of Cullen (US Patent 5,854,854).

Claims 2 and 15 disclose the same limitations and are therefore discussed together.

Claims 3, 8 and 16 disclose the same limitations and are therefore discussed together.

Regarding claims 2 and 15: Yoshida discloses correcting for skew in image data (column 2, lines 15-17 of Yoshida). Yoshida does not disclose expressly adding text characters to said skew corrected image data to form a composite bit map; dividing said composite bit map into a plurality of blocks; identifying a vertical centerline of said

each of said text characters; associating said vertical centerline of said each of said text characters with a respective one of said plurality of blocks; and shifting an entirety of said each of said text characters by a skew correction factor associated with said respective one of said plurality of blocks.

Cullen discloses adding text characters to said skew corrected image data to form a composite bit map (figure 13 and column 4, lines 11-14 of Cullen); dividing said composite bit map into a plurality of blocks (column 4, lines 5-8 of Cullen); identifying a rectangle of said each of said text characters (column 5, lines 33-36 of Cullen); associating said rectangle of said each of said text characters with a respective one of said plurality of blocks (column 5, lines 46-49 of Cullen); and shifting an entirety of said each of said text characters by a skew correction factor associated with said respective one of said plurality of blocks (column 5, lines 53-55 of Cullen). Each rectangle of the composite document image is skew corrected based on the associated skew angle (column 5, lines 53-55 of Cullen). The correction by said skew angle is the skew correction factor associated with a rectangle.

Cullen does not disclose expressly using a vertical centerline instead of a rectangle for the steps of identifying and associating. However, using a vertical centerline instead of a rectangle would have been an obvious design choice to one of ordinary skill in the art since a vertical centerline can also be used to measure an angle, such as a skew angle, associated with a region. The use of vertical centerline for the measurement of an angle is an old and well-known method used in the calculation and manipulation of image regions.

Yoshida and Cullen are combinable because they are from the same field of endeavor, namely skew correction for image print data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the method of correcting for the skew of text, as taught by Cullen, to the general skew correction method taught by Yoshida. The motivation for doing so would have been to reduce the amount of required computer memory and increase the efficiency of the image processing (column 5, lines 22-27 of Cullen). Therefore, it would have been obvious to combine Cullen with Yoshida to obtain the invention as specified in claims 2 and 15.

Regarding claim 5: The arguments regarding claim 2 are incorporated herein. Since there are a plurality of image bytemaps (column 2, lines 12-14 and lines 17-18 of Yoshida), each of said bytemap corresponding to a respective one of a plurality of image planes (column 2, line 64 to column 3, line 5 of Yoshida), then it is inherent that the text characters which are added to the skew corrected image data would therefore be added to at least one of said plurality of image bytemaps to generate at least one composite bytemap.

Regarding claim 6: Yoshida discloses a method for reducing the occurrence of print artifacts in an imaging machine, comprising the steps of determining which of a plurality of printhead units require printhead skew correction (column 2, lines 15-17 of Yoshida); receiving continuous tone data to be printed (column 2, lines 17-19 of Yoshida); and generating from said continuous tone data a plurality of image bytemaps (column 2, lines 12-14 and lines 17-18 of Yoshida), each of said plurality of image bytemaps corresponding to a respective one of a plurality of image planes (column 2,

line 64 to column 3, line 5 of Yoshida) and to a respective one of said plurality of printheads (column 2, lines 29-32 of Yoshida), wherein at least one of said plurality of image bytemaps corresponds to a printhead which requires printhead skew correction (column 2, lines 59-63 of Yoshida). Since image data is supplied for printing (column 2, lines 17-19 of Yoshida) and there are a plurality of print heads (column 2, lines 59-61 of Yoshida), then there are inherently a plurality of image bytemaps, since each bytemap is the data that each corresponding print head needs to print.

Yoshida does not disclose expressly that at least one of said plurality of image bytemaps includes text characters; dividing said composite bit map into a plurality of blocks; assigning a skew correction factor to each of said plurality of blocks; identifying a vertical centerline of said each of said text characters; associating said vertical centerline of said each of said text characters with a respective one of said plurality of blocks; and shifting an entirety of said each of said text characters by a skew correction factor associated with said respective one of said plurality of blocks.

Cullen discloses that the image bytemap includes text characters (figure 13 and column 4, lines 11-14 of Cullen); dividing said composite bit map into a plurality of blocks (column 4, lines 5-8 of Cullen); assigning a skew correction factor to each of said plurality of blocks (column 5, lines 46-48 of Cullen); identifying a rectangle of said each of said text characters (column 5, lines 33-36 of Cullen); associating said rectangle of said each of said text characters with a respective one of said plurality of blocks (column 5, lines 46-48 of Cullen); and shifting an entirety of said each of said text characters by a skew correction factor associated with said respective one of said

plurality of blocks (column 5, lines 53-55 of Cullen). Each rectangle of the composite document image is skew corrected based on the associated skew angle (column 5, lines 53-55 of Cullen). The correction by said skew angle is the skew correction factor associated with a rectangle.

Cullen does not disclose expressly using a vertical centerline instead of a rectangle for the steps of identifying and associating. However, using a vertical centerline instead of a rectangle would have been an obvious design choice to one of ordinary skill in the art since a vertical centerline can also be used to measure an angle, such as a skew angle, associated with a region. The use of vertical centerline for the measurement of an angle is an old and well-known method used in the calculation and manipulation of image regions.

Yoshida and Cullen are combinable because they are from the same field of endeavor, namely skew correction for image print data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the method of correcting for the skew of text, as taught by Cullen, to the general skew correction method taught by Yoshida. The motivation for doing so would have been to reduce the amount of required computer memory and increase the efficiency of the image processing (column 5, lines 22-27 of Cullen). Therefore, it would have been obvious to combine Cullen with Yoshida to obtain the invention as specified in claim 6.

Regarding claim 7: Yoshida discloses applying a halftone screen to the image data of each of said plurality of image planes to generate corresponding halftone image data (column 3, lines 16-18 of Yoshida); and serializing each of said corresponding

halftone image data to a respective one of said plurality of printhead units (column 3, lines 14-18 of Yoshida). The data supplied to the print heads must inherently be halftone data, which is supplied by a halftone screen, in order for the print heads to print the image (column 3, lines 16-22 of Yoshida).

Regarding claims 3, 8 and 16: Yoshida discloses that the halftone dots for each printhead that requires skew correction are shifted by the amount of the skew (column 3, lines 19-25 of Yoshida) such that said halftone dots are printed at the originally intended positions (column 3, lines 25-28 of Yoshida). This is the same as determining a skew correction factor based on the formula $CF(SK,S) = \frac{SW(S-1)}{SL/_{SK+1}} + X$ wherein CF is the skew correction factor, rounded down to the nearest integer, SK is the skew magnitude, SW is a width of each said plurality of blocks, S is a number of the block under consideration, SL is a scan length of a full row of an image bit map, and X is a skew and bow offset. Correcting the skew as taught by Yoshida and calculating a skew correction factor both alter the positions at which the halftone dots are printed such that said halftone dots are printed at the intended positions (column 3, lines 25-28 of Yoshida). Both comprise the same physical embodiment. Both of said physical embodiments are simply expressed differently.

5. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida (US Patent 5,719,680) in view of Cullen (US Patent 5,854,854) and Saund (US Patent 5,835,241).

Regarding claim 11: Yoshida discloses a method for reducing the occurrence of print artifacts in an imaging machine, comprising the steps of determining which of a plurality of printhead units require printhead skew correction (column 2, lines 15-17 of Yoshida); receiving continuous tone data to be printed (column 2, lines 17-19 of Yoshida); generating from said continuous tone data a plurality of image bytemaps (column 2, lines 12-14 and lines 17-18 of Yoshida), each of said plurality of image bytemaps corresponding to a respective one of a plurality of image planes (column 2, line 64 to column 3, line 5 of Yoshida) and to a respective one of said plurality of printheads (column 2, lines 29-32 of Yoshida), wherein at least one of said plurality of image bytemaps corresponds to a printhead which requires printhead skew correction (column 2, lines 59-63 of Yoshida); and applying electronic printhead skew correction (figure 4 and column 2, lines 19-22 of Yoshida) to each image bytemap associated with each said printhead unit which requires said printhead skew correction (column 2, lines 58-63 of Yoshida). Since image data is supplied for printing (column 2, lines 17-19 of Yoshida) and there are a plurality of print heads (column 2, lines 59-61 of Yoshida), then there are inherently a plurality of image bytemaps, since each bytemap is the data that each corresponding print head needs to print.

Yoshida does not disclose expressly that at least one of said plurality of image bytemaps includes text characters; dividing said composite bit map into a plurality of blocks; assigning a skew correction factor to each of said plurality of blocks; identifying a vertical centerline of said each of said text characters; associating said vertical centerline of said each of said text characters with a respective one of said plurality of

blocks; and, for each text character bridging a block boundary between an associated block and an adjacent block, performing the step of shifting a minority portion of said each text character located in said adjacent block not present in said associated block by an amount corresponding to a difference between a skew correction factor corresponding to said associated block and a skew correction factor corresponding to said adjacent block.

Cullen discloses that the image bytemap includes text characters (figure 13 and column 4, lines 11-14 of Cullen); dividing said composite bit map into a plurality of blocks (column 4, lines 5-8 of Cullen); assigning a skew correction factor to each of said plurality of blocks (column 5, lines 46-48 of Cullen); identifying a rectangle of said each of said text characters (column 5, lines 33-36 of Cullen); and associating said rectangle of said each of said text characters with a respective one of said plurality of blocks (column 5, lines 46-48 of Cullen). Each rectangle of the composite document image is skew corrected based on the associated skew angle (column 5, lines 53-55 of Cullen). The correction by said skew angle is the skew correction factor associated with a rectangle.

Cullen further discloses that each rectangular block is corrected for the corresponding skew correction (column 14, lines 51-57 of Cullen). Therefore, if there is a text character bridges a block boundary between an associated block and an adjacent block, then the portion of said character in the associated block will inherently be skew corrected by the skew correction performed for said associated block and the portion of

said character in the adjacent block will inherently be skew corrected by the skew correction formed for said adjacent block.

Cullen does not disclose expressly using a vertical centerline instead of a rectangle for the steps of identifying and associating. However, using a vertical centerline instead of a rectangle would have been an obvious design choice to one of ordinary skill in the art since a vertical centerline can also be used to measure an angle, such as a skew angle, associated with a region. The use of vertical centerline for the measurement of an angle is an old and well-known method used in the calculation and manipulation of image regions.

Yoshida and Cullen are combinable because they are from the same field of endeavor, namely skew correction for image print data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the method of correcting for the skew of text, as taught by Cullen, to the general skew correction method taught by Yoshida. The motivation for doing so would have been to reduce the amount of required computer memory and increase the efficiency of the image processing (column 5, lines 22-27 of Cullen). Therefore, it would have been obvious to combine Cullen with Yoshida.

Yoshida in view of Cullen does not disclose expressly that, for each text character bridging a block boundary between an associated block and an adjacent block, performing the step of shifting a minority portion of said each text character located in said adjacent block not present in said associated block by an amount

corresponding to a difference between a skew correction factor corresponding to said associated block and a skew correction factor corresponding to said adjacent block.

Saund discloses using interpolating image data (column 13, lines 48-54 of Saund) in order to display said image data in a properly de-warped image space (column 13, lines 31-34 of Saund).

Yoshida in view of Cullen is combinable with Saund because they are from the same field of endeavor, namely the alignment of image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to interpolate the image data to correct for warping, as taught by Saund. A text character bridging a block boundary between an associated block and an adjacent block would therefore have a minority portion shifted by an amount corresponding to a difference between a skew correction factor corresponding to said associated block and a skew correction factor corresponding to said adjacent block since the warping, or skew correction, amount for said minority portion would be an interpolation between said associated block and said adjacent block. The motivation for doing so would have been to properly show each pixel of an image in the transformed image space (column 13, lines 25-27 of Saund). Therefore, it would have been obvious to combine Saund with Yoshida in view of Cullen to obtain the invention as specified in claim 11.

Regarding claim 12: Yoshida discloses applying a halftone screen to said plurality of image bytemaps (column 2, lines 18-22 of Yoshida) after the step of applying electronic printhead skew correction (column 2, lines 15-17 of Yoshida). Supplying data to a print head (figure 5 and column 2, lines 21-22 of Yoshida) inherently requires a

halftone screen in order to obtain the print dot locations. Furthermore, since image data is supplied for printing (column 2, lines 17-19 of Yoshida) and there are a plurality of print heads (column 2, lines 59-61 of Yoshida), then there are inherently a plurality of image bytemaps, since each bytemap is the data that each corresponding print head needs to print.

Regarding claim 13: Yoshida discloses that the halftone dots for each printhead that requires skew correction are shifted by the amount of the skew (column 3, lines 19-25 of Yoshida) such that said halftone dots are printed at the originally intended positions (column 3, lines 25-28 of Yoshida). This is the same as determining a skew correction factor based on the formula $CF(SK,S) = \frac{SW(S-1)}{SL/_{SK+1}} + X$ wherein CF is the skew correction factor, rounded down to the nearest integer, SK is the skew magnitude, SW is a width of each said plurality of blocks, S is a number of the block under consideration, SL is a scan length of a full row of an image bit map, and X is a skew and bow offset. Correcting the skew as taught by Yoshida and calculating a skew correction factor both alter the positions at which the halftone dots are printed such that said halftone dots are printed at the intended positions (column 3, lines 25-28 of Yoshida). Both comprise the same physical embodiment. Both of said physical embodiments are simply expressed differently.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mori et al., US Patent 5,587,771, December 24, 1996.

Morisumi Kurose, US Patent 4,953,230, August 28, 1990.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
May 14, 2004

DAVID MOORE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

David K Moore